

THE LSD-155

Cutting Edge automated III-V
Laser Diode and Wafer Processing

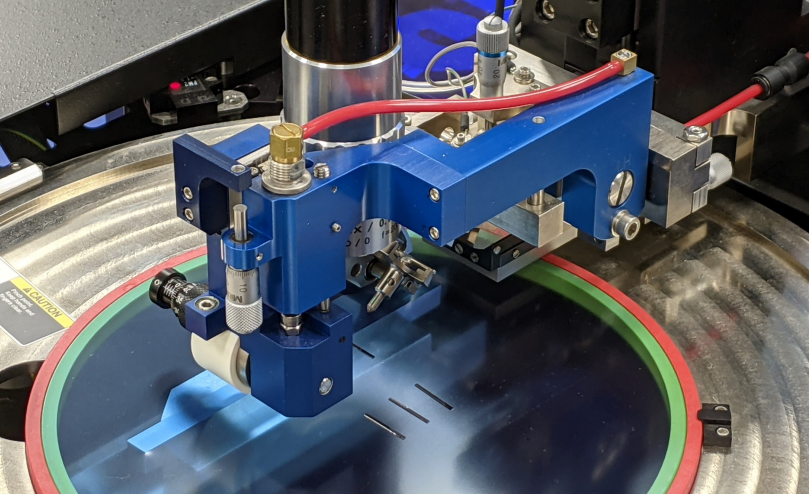
■ AUTOMATION

■ PRODUCTIVITY

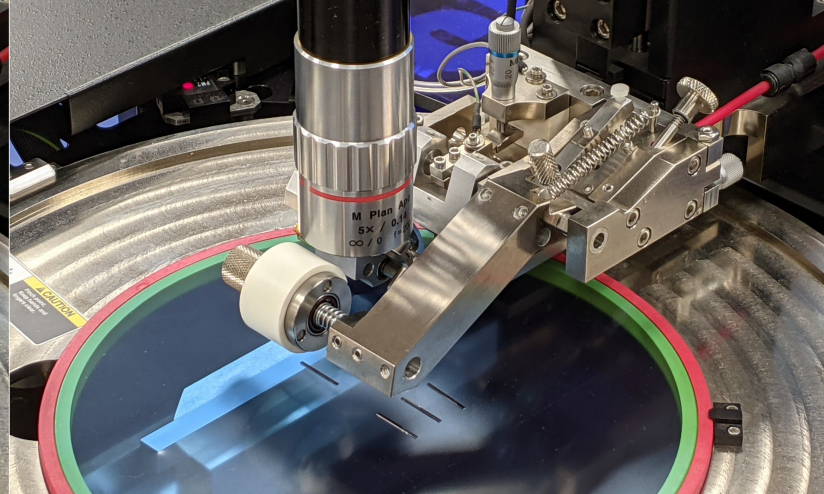
■ FLEXIBILITY

LOOMIS LSD-155 LSD-155LT

Speed, product quality and yield speak for themselves.
Contact Loomis Industries for information or a demonstration.



LSD-155



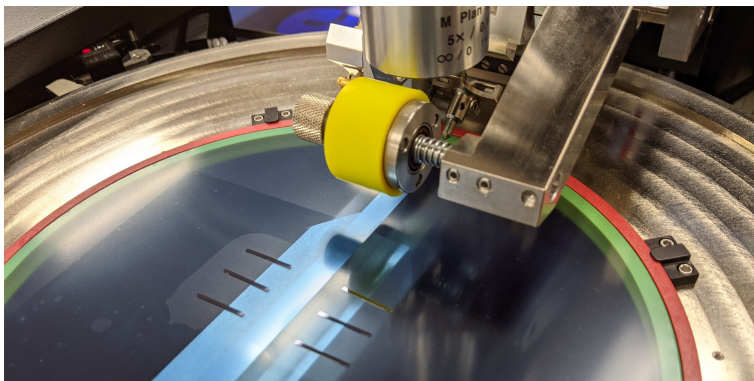
LSD-155Lt

The Loomis Industries LSD-155 introduced many new technical features, and it set the standard for automation, productivity, and flexibility. Combining these essential items with accuracy and ease of use make the LSD-155 and new LSD-155Lt the products of choice for processing laser diodes and wafers.

AUTOMATION

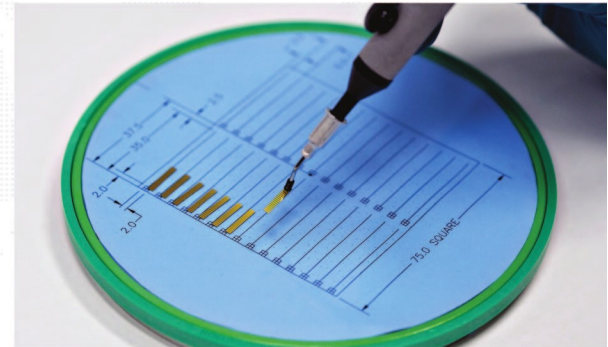
The LSD-155 is a production-level tool that:

- Automatically processes large grids, or arrays of laser bars for dicing, cleaving high quality mirror facets, and dicing wafers.
- Uses advanced automation features that allow the high resolution vision system to process your wafers with micron-level accuracy.
- A tuned, low-inertia scribing module allows fast peck speeds, while maintaining optimal peck quality.
- Multiple cleaving options allow the LSD-155 and 155Lt to be configured to optimize cleave quality and speed.



FLEXIBILITY

The LSD-155 can be configured to **function with your existing equipment** and process requirement by utilizing common wafer holding media. These include 6" & 7" ring pairs, saw frames, vacuum chuck & the Loomis square frame. A variety of scribe tools, objective lenses and mandrels and cleaving options are available to optimize the process to your specific application.



YIELD

Loomis Customers consistently experience industry-leading yields with clean, efficient and debris-free die. These results are the culmination of:

- Precision scribe tools manufactured by Loomis Industries using proprietary polishing and alignment techniques.
- A toolholder designed to properly hold the diamond and accurately scribe your wafer at the optimum angle, force and speed.
- Controlled strain cleaving, configured to meet your application needs.
- Processes developed to meet your unique application.

INTELLIGENT CUSTOMER DRIVEN DESIGN

KEY ADVANTAGES

Integration of the scribing and cleaving processes give **key advantages**:

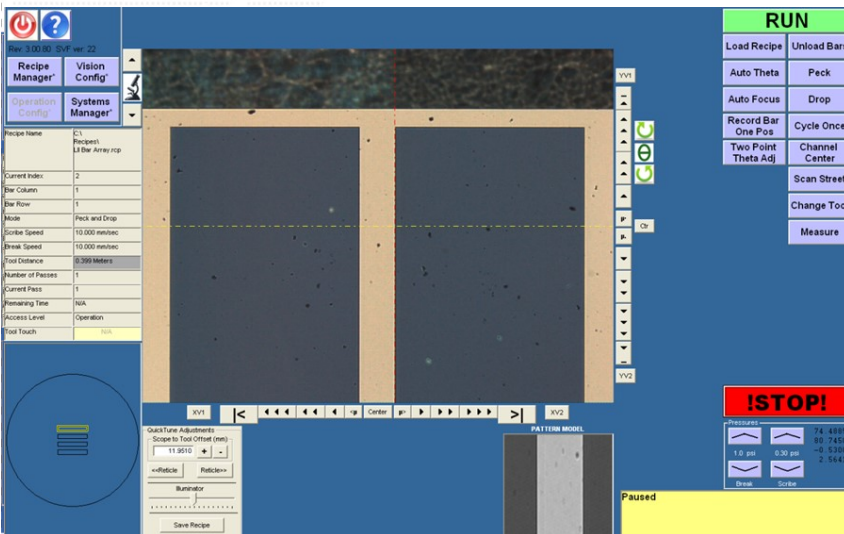
- **OPERATOR PRODUCTIVITY:** Fewer transfer, alignment and process monitoring operations are necessary resulting in your operators performing other essential tasks.
- **REDUCED TRANSFER OPERATIONS:** Minimal material handling means fewer alignment processes and higher levels of throughput.
- **REDUCED REDUNDANCY REQUIREMENTS:** 2 Loomis LSD-155s provide full process redundancy. Equipment limited to scribe only/break only require the purchase 4 machines for full redundancy.
- **PROCESS MONITORING:** The LSD-155 integrated scribe and cleave processing allows for tighter process monitoring. Stand alone scribe then cleave operations suffer from large scale material loss when their scribing process fails and is only detected after large quantities of material have been ineffectively scribed.

The hardware behind the LSD-155 is key to its speed, precision and accuracy.

- **HIGH-RESOLUTION SERVO MOTORS CONTROL SMOOTH, ACCURATE MULTI-AXIS MOTION ON AN AIR-BEARING PLATFORM.**
- **QUALITY MITUTOYO OPTICS ENSURE AN OPTICALLY CORRECT FIELD OF VIEW THAT CAN BE CUSTOMIZED WITH INTERCHANGEABLE OBJECTIVE LENSES FOR APPLICATIONS REQUIRING VERY HIGH MAGNIFICATION.**
- **ULTRA-HIGH RESOLUTION MICROMETER HEADS ENSURE THAT SCRIBE TOOL ALIGNMENT IS SIMPLE AND YOUR SCRIBE PLACEMENT IS PERFECT.**

EASE OF OPERATION

The LSD-155 Software control package was developed with extensive customer input and has the features for processing your material efficiently. Straight-forward menu structures, intuitive operation and simple recipe setups allow easy setup for automated processing. Once a recipe has been developed, an operator only needs to load the material and press "Start", allowing the machine operator to perform other tasks without monitoring the process. The LSD-155 uses highly refined vision algorithms to find, align and process your material with minimal operator supervision.



LSD-155/155Lt Specifications and Service Requirements

Scriber

Dimensions (h,w,d)	(28.0, 39.0, 27.0) in	(71.1, 99.0, 68.6) cm
Weight	175.0 lbs	79.4 kg

Controller (specifications may vary) Included With System

Dimensions (h,w,d)	(16.5, 7.5, 17.0) in	(41.9, 19.1, 43.2.) cm
Weight	30.1 lbs	13.7 kg

Monitor (specifications may vary) Included With System

Dimensions (h,w,d)	(17.5, 15.2, 3.5) in	(44.5, 38.6, 8.9) cm
Weight	8.5 lbs	3.9 kg

Ergonomics

Seated station

Height of keyboard, trackball, or mouse	Minimum 710 mm (28 in.)	Maximum 760 mm (30 in.)
Vertical leg clearance	Minimum 673 mm (26.5 in.)	
Horizontal leg clearance; depth at knee level	Minimum 508 mm (20 in.)	
Horizontal leg clearance; depth at foot level	Minimum 660 mm (26 in.)	depth x 254 mm (10 in.) vertical foot clearance
Horizontal leg clearance; width	Minimum 610 mm (24 in.)	
Thickness of work surface		Maximum 51 mm (2 in.)
Work surface edge radius	Minimum 6 mm (0.25 in.) radius	

Electrical Specifications

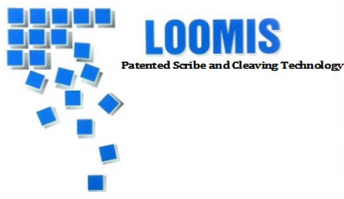
Power Requirements	100-240 V, 50/60 Hz
Power Consumption	0.67 Amps
AIC Breaker Requirement	10,000 Amps
SCCR	1.5 Amps

Pneumatic Specifications

Pressure Requirements	70 to 85 psi, 4.8 to 5.8 BAR	483 to 586 kPa
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Ratings and Inputs

Operating Temperature Range	Altitude to 2000m, +5 to +35°C
Max and Min humidity at temp	80% to 31°C, decreasing to 50% at +40°C
Input voltage variance	+/- 10% of nominal
Environment	Cleanroom
Pollution Degree	2
Network Type	TN
Protection Class	Minimum IP10



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Equipment Selection Information for Scribe--Dicing Laser Diode & Detector Materials



Feature	LSD-155Lt	LSD-155
Wafer Dicing, Laser Diode cleaving and dicing	Fully-Automatic	Fully Automatic
Material Location & Alignment	Automatic	Automatic
Processing time for Grid of Laser Bars¹	15 minutes (automatic) 6 bars (max)	23 minutes (automatic) 10 bars
Fast peck² speed³	up to 50 pecks/minute	up to 50 pecks/minute
Internet connectivity for Loomis Support	Yes	Yes
Laser Bar Navigation	Interactive Graphic	Interactive Graphic
High speed peck feedback sensor	Yes	Yes
Password level for operator, tech & maintenance levels	Yes	Yes
Recipe Controlled Scribe & Break Pressures	Yes	Yes
Cleaving Options	Pivoting Break-wheel ONLY	Vertical Moving Break-wheel or Beam
Optics	5X standard, 10 & 20X available	5X standard, 10 & 20X available
Camera Type & Resolution	GigE 1440 x 1080	GigE 1440 X 1080
Machine Capacity	up to 100 mm	up to 150 mm ⁴
Focus	Manual/Automatic	Manual/Automatic
Wafer Mounting Media⁵	a, b, c, d, e	a, b, c, d, e
Y-axis operation	servo (100mm/s max suggested)	servo (100mm/s max suggested)
X-axis operation	servo (90mm/s) max.	servo (90mm/s) max.
X-axis precision⁶	0.3 μm resolution/count	0.3 μm resolution/count
Y-axis precision	0.5 μm resolution/count	0.5 μm resolution/count
Max Theta axis rotation	360 degrees	360° degrees
X & Y motion stages	Air Bearing	Air Bearing
Scribe tool & Peck & Cleaving Adjustments	Micrometers	Micrometers
75 PSI air or Nitrogen required	Yes	Yes
Vacuum Required	No	No
Air, Nitrogen flow rate (operation/sleep)	0.4 LPM/0 LPM	0.4 LPM/0 LPM
Suggested Applications	R&D, Production, High Accuracy	R&D, Production, High Accuracy

¹ Peck & Drop with vision check/alignment every 3 channels on 10 Laser test bars 13 mm long with 0.650 mm device index.

² Peck is a short scribe of 1mm or less

³ Peck 600 μm long, no vision check, fast pecking enabled, index <1 mm

⁴ Loomis does not supply tape handling equipment, wafer mounters, or expanders for 150mm wafers. Custom modifications are sometimes necessary for larger wafers.

⁵ a) Loomis Square Frame, b) 6" Ring Pair, c) 7" Ring Pair, d) FF105/FF107 Saw Frame, e) FF040 Saw Frame

⁶ X-axis precision & accuracy can be impacted by tape drag and other process factors. Submicron position is achievable when utilizing vision system verification.

